

*Phos Acid Feed To Coagulation Plant*

**Product Data Sheet**

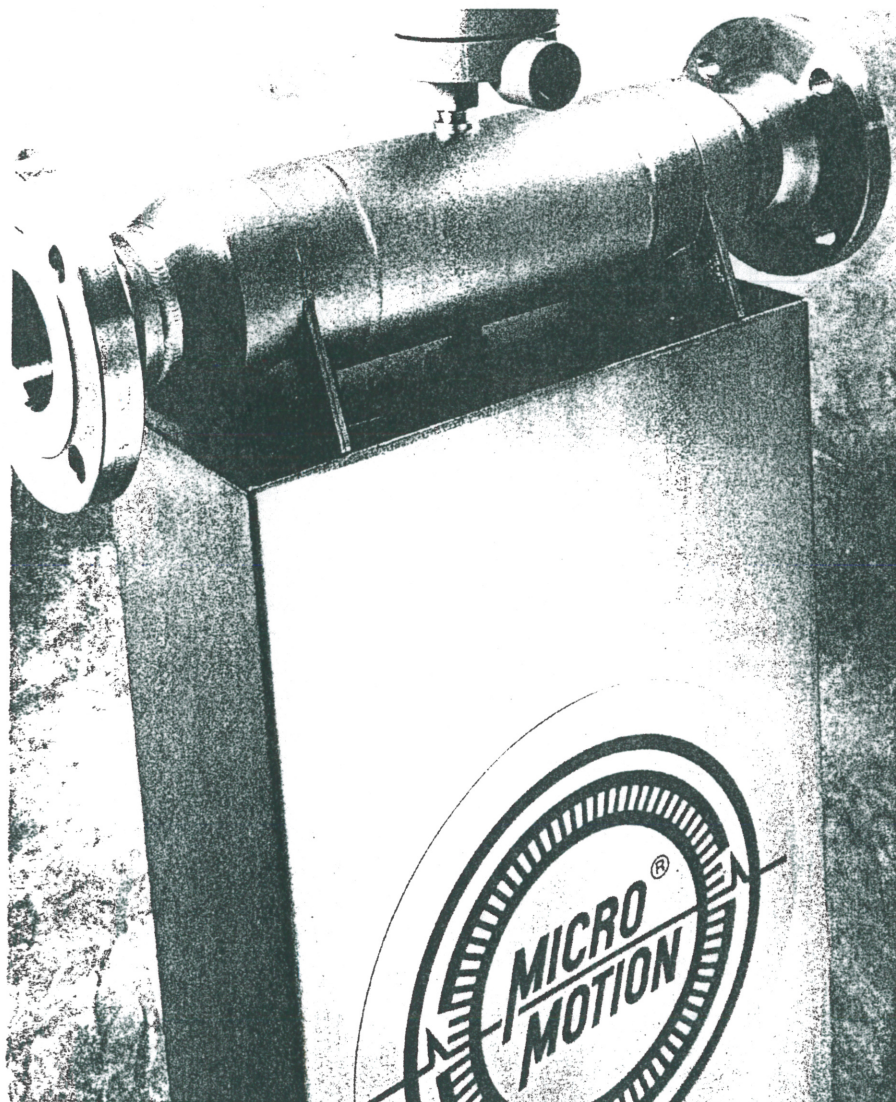
PS-00388, Rev. A

October 2003

*Attachment 20.*

## **Model D and DT**

Mass Flow and Density Sensors



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**Micro Motion**

**EMERSON**  
Process Management

## Gas flow performance *continued*

### Accuracy<sup>(1)</sup>

All models except D300 and DH38	Transmitter with MVD Technology	$\pm 0.65\%^{(2)}$
	All other transmitters	$\pm 0.65\% \pm \left[ \left( \frac{\text{zero stability}}{\text{flow rate}} \right) \times 100 \right] \% \text{ of rate}$
Model DH38	Transmitter with MVD Technology	$\pm 0.50\%^{(3)}$
	All other transmitters	$\pm 0.50\% \pm \left[ \left( \frac{\text{zero stability}}{\text{flow rate}} \right) \times 100 \right] \% \text{ of rate}$

### Repeatability<sup>(1)</sup>

All models except D300 and DH38	Transmitter with MVD Technology	$\pm 0.30\%^{(2)}$
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Zero stability		lb/min	kg/hr
Standard sensors	D150 Tefzel	0.30	8.2
	D300	0.70	19.1
	D600	2.5	68.1
High-pressure sensors	DH25	0.006	0.16
	DH38	0.025	0.62
	DH100	0.30	8.2
	DH150	1.2	32.7
	DH300	4.0	109.0
High-temperature sensors	DT65	0.03	0.82
	DT100	0.08	2.18
	DT150	0.14	3.81

(1) Flow accuracy includes the combined effects of repeatability, linearity, and hysteresis. All specifications for liquids are based on reference conditions of water at 68 to 77 °F (20 to 25 °C) and 15 to 30 psig (1 to 2 bar), unless otherwise noted.

(2) When flow rate  $< \frac{\text{zero stability}}{0.0065}$ , accuracy =  $\pm \left[ \left( \frac{\text{zero stability}}{\text{flow rate}} \right) \times 100 \right] \% \text{ of rate}$  and

repeatability =  $\pm \left[ \frac{1}{2} \left( \frac{\text{zero stability}}{\text{flow rate}} \right) \times 100 \right] \% \text{ of rate}$ .

(3) When flow rate  $< \frac{\text{zero stability}}{0.005}$ , accuracy =  $\pm \left[ \left( \frac{\text{zero stability}}{\text{flow rate}} \right) \times 100 \right] \% \text{ of rate}$  and

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*Phos Acid Feed To Granulation Plant*

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PS-00388, Rev. A

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000054

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## Rosemount 3051

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Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

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A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

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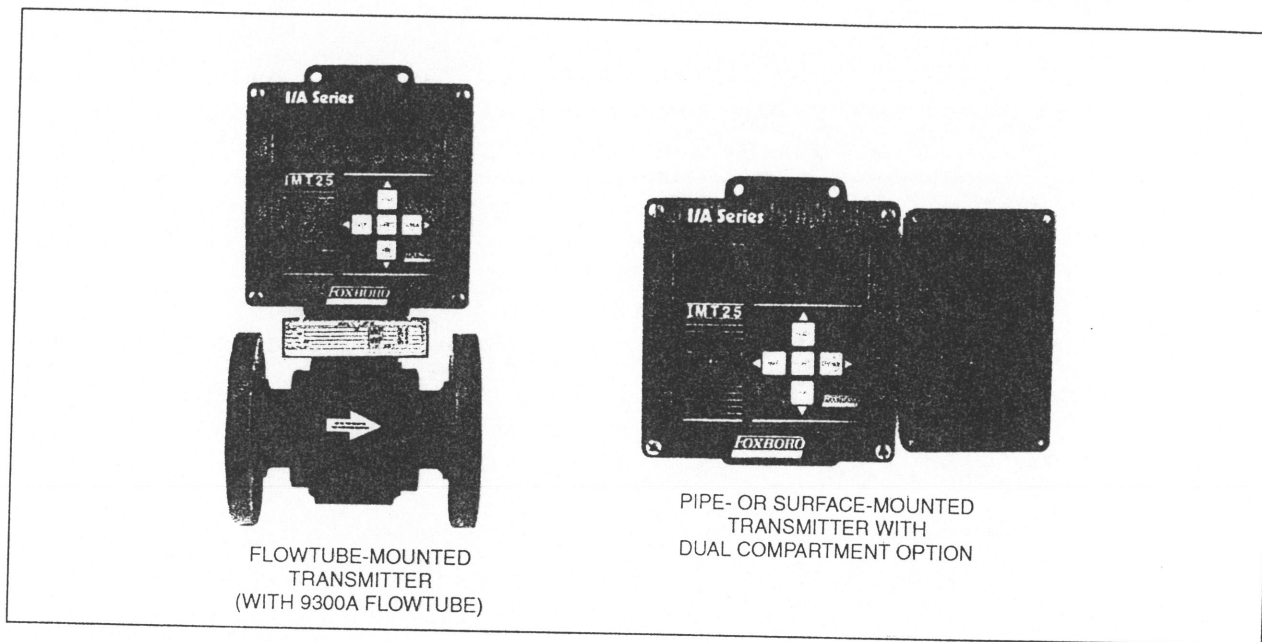
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Product Specifications

PSS 1-6F5 A

**I/A Series® Intelligent Magnetic Flow Transmitters**  
**Model IMT25**  
**with FoxCom™ or HART® Communication Protocol**



The IMT25 Magnetic Flow Transmitter, together with an 8000A Wafer Body, or 2800, 8300, 9100A, 9200A, or 9300A Flanged Body Flowtube, combines to form a Magnetic Flowmeter with pulsed dc excitation.

**FEATURES**

- Compatible with Foxboro family of flowtubes.
- Digital precision, stability, and resolution ensure top measurement performance.
- Remote communication via FoxCom or HART Communication Protocol. For FOUNDATION® Fieldbus Protocol, refer to PSS 1-6F5 B.
- Remote configuration using I/A Series System Workstation, Foxboro PC-Based Configurator, or HART Communicator.
- Local configuration using optional integral keypad, with backlit, 2-line, LCD display.
- Compact single or dual compartment.
- Enclosure meets NEMA® 4X and IEC IP66.
- Scaled or frequency pulse output.
- Unidirectional or bidirectional flow.
- Analog output programmable for unidirectional, bidirectional, or multiple input range.
- Relay outputs with programmable functionality for alarms.
- Contact inputs with programmable functionality for remote operation.
- Automatic and manual zero lock.
- Online diagnostic help.
- Software configuration and totals protected in nonvolatile memory in the event of power loss.
- Intrinsically safe electrodes circuit (European applications only).
- Conforms to applicable European Union Directives (product marked with "CE" logo).
- 85 to 264 V ac or 24 V dc input power options.
- Optional I/O access port allows direct external connection of remote configurator.
- Field test mode using Foxboro Model IMTSIM Magnetic Flow Simulator.
- Standard 2-year warranty.

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Invensys®  
**FOXBORO®**

# **SYSTEM PERFORMANCE SPECIFICATIONS – TRANSMITTER AND FLOWTUBE** (At Reference Operating Conditions unless Otherwise Specified)

## **Accuracy Notes**

- Accuracy specified as percent of flow rate reading, unless otherwise indicated.
- Accuracy specified using water as the fluid at reference operating conditions.
- Accuracy specified with 8000A, 8300, 9100A, 9200A, 9300A, and 2800 Series Flowtubes
- Accuracy rating assumes no flange piping mismatch, and also assumes a straight pipe upstream (5 pipe diameters minimum) and a straight pipe downstream (3 pipe diameters minimum) measured from center of flowtube.
- Accuracy rating includes effects of hysteresis, linearity, zero error, and repeatability.

## **Accuracy – Pulse and Digital Output; with 8000A, 8300, and 2800 Series Flowtubes**

8000A	8300	2800(a)	System Accuracy	Flow Velocity
1/2 to 6 in (15 to 150 mm)	1/2 to 18 in (15 to 450 mm)	None	±0.25% of Reading	≥2.0 fps (≥0.61 m/s)
			±0.005 ft/s (±0.0015 m/s)	<2.0 fps (<0.61 m/s)
1/16 to 1/4 in (1.16 to 6 mm)	20 to 36 in (500 to 900 mm)	None	±0.50% of Reading	≥2.0 fps (≥0.61 m/s)
			±0.010 ft/s (±0.00305 m/s)	<2.0 fps (<0.61 m/s)
None	None	All Sizes	±1.00% of Reading	≥3.3 fps (≥1 m/s)
			±0.033 ft/s (±0.010 m/s)	<3.3 fps (<1 m/s)

(a) Values in table above are for 2800 Series Flowtubes that have been calibrated for use with IMT25 Transmitters. An average factor can be used, at a reduced accuracy, for 2800 Series Flowtubes that do not have an IMT25 Transmitter calibration factor.

## **Accuracy – Pulse and Digital Output; with 9100A, 9200A, and 9300A Flowtubes**

9100A	9200A	9300A	System Accuracy	Flow Velocity
None	None	1/2 to 6 in (25 to 150 mm)	±0.25% of Reading	≥2.0 fps (≥0.61 m/s)
			±0.005 ft/s (±0.0015 m/s)	<2.0 fps (<0.61 m/s)
1 to 78 in (25 to 2000 mm)	8 to 40 in (200 to 1200 mm)	8 to 16 in (200 to 400 mm)	±0.50% of Reading	≥2.0 fps (≥0.61 m/s)
			±0.010 ft/s (±0.00305 m/s)	<2.0 fps (<0.61 m/s)

## **Accuracy – 4 to 20 mA Output**

Same as for pulse and digital outputs except add ±0.03% of span (which equates to ±0.0048 mA) to pulse and digital accuracy values above.

## **Response Time**

Digital and Pulse		4 to 20 mA
50 Hz	60 Hz	Add 0.150 sec
0.2 sec	0.167 sec	

## **Ambient Temperature Effect**

(For any variation from Reference Operating Temperature within the Operating Limits)

DIGITAL OUTPUT

< 0.5% of span

4 to 20 mA OUTPUT

< 1% of span

PULSE OUTPUT

< 0.5% of span

## **RFI Effect**

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

## **Supply Voltage Effect**

DIGITAL AND PULSE OUTPUT

A change in supply voltage of +10 or -15% from reference can cause the output to change <0.1% or <0.15% of reading, or <0.001% or 0.0015% of flowmeter capacity, whichever is greater.

4 TO 20 mA OUTPUT

Digital/Pulse output effect plus an additional error of 0.005%/volt

## **RFI Effect**

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

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# Instruction Manual

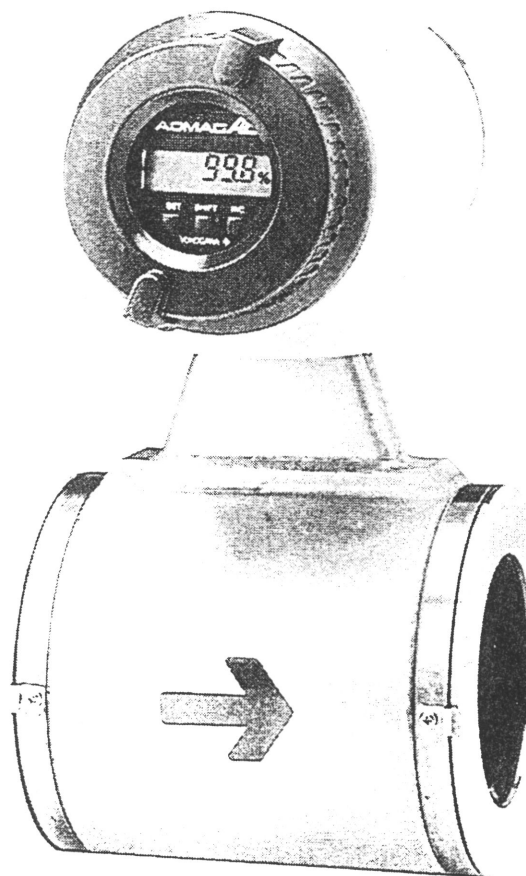
**ADMAG AE**

Models AE100M / 200M

Integral Type Magnetic Flowmeter

*Dryer Scrubber Acid Flow*

IM 1E7B0 - 02E



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## 3.2 Standard Performance

### • Accuracy : PFA and Ceramic Lining

Size in mm (inch)	Flow Velocity Span m/s (ft/s)	Accuracy
2.5 (0.1) to 15 (0.5)	0.3 (1) to less than 1 (3)	1% of span (0.5%, / HAC)
	1 (3) to 10 (33)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)
25 (1) to 200 (8)	0.3 (1) to less than 1 (3)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)
	1 (3) to 10 (33)	0.2% of span (at indications below 20% of span) (0.1%, / HAC)
		1% of rate (at indications more 20% of span) (0.5%, / HAC)

### Polyurethane Rubber

Size in mm (inch)	Flow Velocity Span m/s (ft/s)	Accuracy
25 (1) to 200 (8)	0.3 (1) to less than 1 (3)	1% of span (0.5%, / HAC)
	1 (3) to 10 (33)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)

### • Measuring Span (Flowrate Span) :

Size mm (inch)	Min. Measuring Range		Max. Measuring Range	
	Flow Velocity m/s (ft/s)	Flowrate m <sup>3</sup> /h (GPM)	Flow Velocity m/s (ft/s)	Flowrate m <sup>3</sup> /h (GPM)
2.5 (0.1)	0 to 0.3 (1)	0 to 0.0054 (0.024)	0 to 10 (33)	0 to 0.176 (0.8)
5 (0.2)	0 to 0.3 (1)	0 to 0.022 (0.1)	0 to 10 (33)	0 to 0.706 (3.1)
10 (0.4)	0 to 0.3 (1)	0 to 0.085 (0.38)	0 to 10 (33)	0 to 2.82 (12.4)
15 (0.5)	0 to 0.3 (1)	0 to 0.2 (0.84)	0 to 10 (33)	0 to 6.36 (28.0)
25 (1.0)	0 to 0.3 (1)	0 to 0.54 (2.35)	0 to 10 (33)	0 to 17.6 (78.0)
40 (1.5)	0 to 0.3 (1)	0 to 1.36 (6.00)	0 to 10 (33)	0 to 45.2 (200)
50 (2.0)	0 to 0.3 (1)	0 to 2.13 (9.35)	0 to 10 (33)	0 to 70.6 (310)
80 (3.0)	0 to 0.3 (1)	0 to 5.43 (24.0)	0 to 10 (33)	0 to 180 (800)
100 (4.0)	0 to 0.3 (1)	0 to 8.49 (37.5)	0 to 10 (33)	0 to 282 (1,250)
150 (6.0)	0 to 0.3 (1)	0 to 19.1 (84.0)	0 to 10 (33)	0 to 636 (2,800)
200 (8.0)	0 to 0.3 (1)	0 to 34.0 (15.0)	0 to 10 (33)	0 to 1,136 (5,000)

### • Liquid Conductivity : Size 15 mm (0.5") and above

; 5  $\mu$ S/cm or more

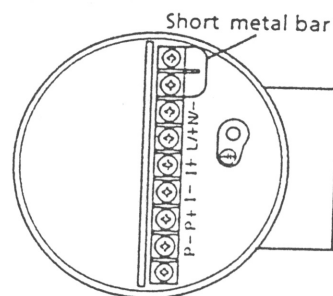
Size: 2.5 (0.1"), 5 (0.2"), 10 mm (0.4")

; 20  $\mu$ S/cm or more

### • Power Consumption : 12.5 W or less

### • Insulation Resistance : 100 M $\Omega$ between power terminals and ground terminal at 500 V DC, 100 M $\Omega$ between power terminals and each output and contact input terminals at 500 V DC

Before testing the Insulation Resistance always disconnect the short metal bar (jumper) as shown in the figure at below  
After testing, you must return to their original status



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## Product Data Sheet

00813-0100-4727, Rev KA

Catalog 2004

# Rosemount 8700 Series

## Performance Specifications

(System specifications are given using the unit at referenced conditions.)

### Accuracy

#### Rosemount 8742C Transmitter with 8705 and 8721 Flowtubes

System accuracy is  $\pm 0.5\%$  of rate from 1 to 40 ft/s (0.3 to 12 m/s); includes combined effects of linearity, hysteresis, repeatability, and calibration uncertainty; below 1.0 ft/s (0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s (0.0015 m/s).

#### Rosemount 8742C Transmitter with 8711 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 3 to 40 ft/s (0.9 to 12 m/s); includes combined effects of linearity, hysteresis, repeatability, and calibration uncertainty; below 3 ft/s (0.9 m/s), the system has an accuracy of  $\pm 0.015$  ft/s (0.005 m/s).

### Vibration Effect

IEC 60770-1

### Repeatability

$\pm 0.1\%$  of reading

### Response Time

0.2 seconds maximum response to step change in input

### Stability

$\pm 0.1\%$  of rate over six months

### Ambient Temperature Effect

$\pm 0.25\%$  of rate over operating temperature range

### EMC Compliance

EN61326-1 1997 (Industrial) electromagnetic compatibility (EMC) for process and laboratory apparatus.

### Transient Protection

The 8742C transmitter prevents damage to the flowmeter from transients compliant to:

IEC 6100 – 4-4 (for burst currents)

IEC 6100 – 4-5 (for surge currents)

### Mounting Position Effect

None when installed to ensure flowtube remains full

## Physical Specifications

### Materials of Construction (Transmitter)

#### Housing

Low-copper aluminum

#### Paint

Polyurethane

#### Cover Gasket

Rubber

### Electrical Connections

Two  $\frac{3}{4}$ –14 NPT with number 8 screw terminal connections are provided for electrical wiring. PG13.5 and CM20 adapters are available. Screw terminals provided for all connections. Power wiring connected to transmitter only. Integrally mounted transmitters are factory wired to the flowtube.

### Mounting

Integrally mounted transmitters do not require interconnecting cables. The local display and transmitter can be rotated in 90° increments. Remote mounted transmitters require only a single conduit connection to the flowtube.

### Weight

Approximately 7 pounds (3.2 kg). Add 0.5 pounds (0.5 kg) for local display.

8700 Series

000044



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## PART I. GETTING STARTED

*P205 Feed Density To Phos Acid Plant*

### A. Introducing the BSI Density System

The BSI Density System offers a non-contacting measurement capable of indicating the density or specific gravity of process liquids, suspensions, or bulk materials flowing in pipes as large as 24 inches in diameter or contained in tanks/vessels when using a special arrangement (consult factory). This measuring technique is not effected by pressure changes, viscosity fluctuations, or changes in flow velocity.

These measurements require that the distance between the source and detector as well as the measuring path (inside diameter of pipe) be fixed. Under these conditions, the signal received by the scintillation detector is only dependent on the density of the product being measured.

#### 1. Averaging

The signal strength measured by the scintillation detector fluctuates due to the statistical nature of the Cs-137 or Co-60 Source. The microprocessor unit calculates a sliding average of the signal strength which is used to calculate the density.

2. The operational accuracy of each installed system will depend on such factors as:

- Measurement range (minimum to maximum density)
- Pipe size
- Source size (limited by cost and regulatory requirements)
- Quality of calibration performed
- Condition of process material

Typically it is possible to achieve an accuracy of .001 grams/cc if the quality of the calibration is high. Some calibration techniques are better than others but each and every calibration is susceptible to operator error. The degree of operator error depends on:

- The care with which the calibration is performed,
- The stability of the process during calibration and
- The quality of the equipment which is used during the calibration procedure.

# Rosemount 8700 Series

Product Data Sheet  
00813-0100-4727, Rev  
Catalog 20

## Performance Specifications

(System specifications are given using the frequency output and with the unit at referenced conditions.)

### Accuracy

#### Rosemount 8712C/U with 8705 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 1 to 30 ft/s (0.3 to 10 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s. Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

#### Rosemount 8712H with 8707 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 3 to 30 ft/s (1 to 10 m/s); between 0.04 and 3.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s. Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

#### Rosemount 8712C/U with 8711 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 3 to 30 ft/s (1 to 10 m/s); below 3 ft/s (1 m/s), the system has an accuracy of  $\pm 0.015$  ft/s (0.005 m/s). Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

#### Rosemount 8712U/D with Other Manufacturers' Flowtubes

When calibrated in the Rosemount Flow Facility, system accuracies as good as 0.5% of rate can be attained. Analog output has the same accuracy as frequency output, plus an additional 0.05% of span.

There is no accuracy specification for other manufacturers' flowtubes calibrated in the process line.

#### Rosemount 8712D with 8705 and 8721 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 1 to 40 ft/s (0.3 to 12 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s. Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

#### Rosemount 8712D with 8711 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 3 to 40 ft/s (1 to 12 m/s); below 3 ft/s (1 m/s), the system has an accuracy of  $\pm 0.015$  ft/s (0.005 m/s). Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

### Vibration Effect

$\pm 0.1\%$  of span per SAMA PMC 31.1, Level 2

### Repeatability

$\pm 0.1\%$  of reading

### Response Time

0.2 seconds maximum response to step change in input

### Stability

$\pm 0.1\%$  of rate over six months

### Ambient Temperature Effect

8712C/U/H:  $\pm 1\%$  per 100 °F (37.8 °C)

8712D: 0.25% over operating temperature range

### RFI Effect

Class 1, A, B, C:  $\pm 0.5\%$  of span at 3 V/m per SAMA PMC 33.1, wires and conduit

### Supply Voltage Effect

Transmitter meets supply voltage effect requirements of SAMA PMC 31.1, Section 5.10.1 through 5.10.5. Transmitter withstands surges in supply voltage as specified in IEEE 472, 1974

## Physical Specifications

### Materials of Construction

#### Housing

Low-copper aluminum, NEMA 4X and IEC 529 IP65  
Pollution Degree 2

#### Paint

Polyurethane

#### Cover Gasket

Rubber

### Electrical Connections

Three 3/4-14 NPT connections provided on the base of the transmitter. Screw terminals provided for all of the connections. Power wiring connected to the transmitter only. Remote mounted transmitters require only a single conduit connection to the flowtube. Integrally mounted transmitters are factory wired to the flowtube.

### Line Power Fuses

#### 115 V ac systems

1 amp, Quick-acting Bussman AGCI or equivalent.  
5 amp, Quick-acting Bussman AGCI or equivalent (Rosemount 8712H only).

#### 230 V ac systems

1/2 amp, Quick-acting Bussman AGCI or equivalent

#### 90-250 V ac systems (8712D)

1 amp, Quick-acting Bussman AGCI or equivalent

#### 10-30 V dc systems

3 amp, Quick-acting Bussman AGCI or equivalent

### Transmitter Weight

Transmitter approximately 9 lb (4 kg). Add 1 lb (0.5 kg) for local operator interface.

8700 Series

000038

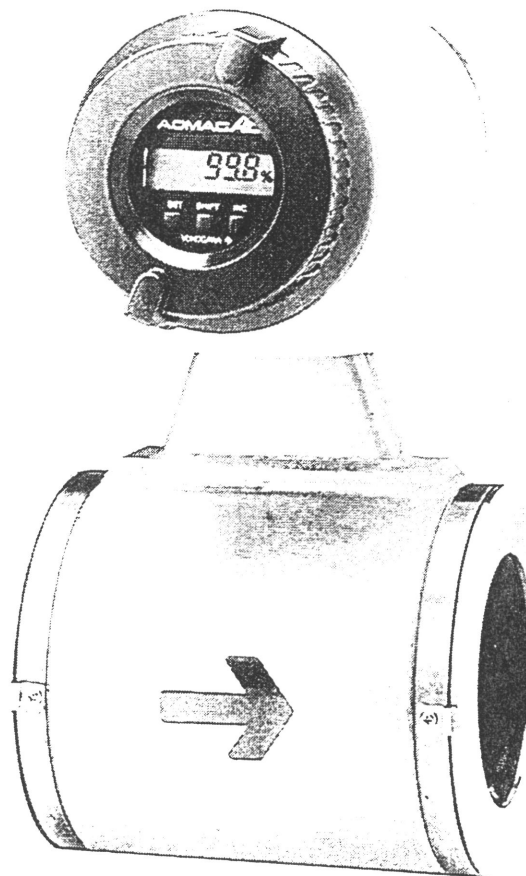


# Instruction Manual

## ADMAG *AE* Models AE100M / 200M Integral Type Magnetic Flowmeter

*P205 Feed To Phos Acid Plant*

IM 1E7B0 - 02E



000039

## 3.2 Standard Performance

- Accuracy : PFA and Ceramic Lining

Size in mm (inch)	Flow Velocity Span m/s (ft/s)	Accuracy
2.5 (0.1) to 15 (0.5)	0.3 (1) to less than 1 (3)	1% of span (0.5%, / HAC)
	1 (3) to 10 (33)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)
25 (1) to 200 (8)	0.3 (1) to less than 1 (3)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)
	1 (3) to 10 (33)	0.2% of span (at indications below 20% of span) (0.1%, / HAC)
		1% of rate (at indications more 20% of span) (0.5%, / HAC)

### Polyurethane Rubber

Size in mm (inch)	Flow Velocity Span m/s (ft/s)	Accuracy
25 (1) to 200 (8)	0.3 (1) to less than 1 (3)	1% of span (0.5%, / HAC)
	1 (3) to 10 (33)	0.5% of span (at indications below 50% of span) (0.25%, / HAC)
		1% of rate (at indications more 50% of span) (0.5%, / HAC)

- Measuring Span (Flowrate Span) :

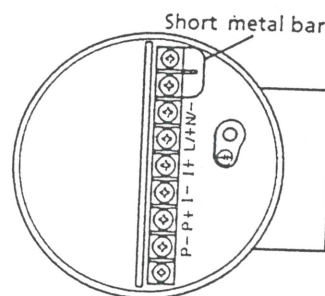
Size mm (inch)	Min. Measuring Range		Max. Measuring Range	
	Flow Velocity m/s (ft/s)	Flowrate m <sup>3</sup> /h (GPM)	Flow Velocity m/s (ft/s)	Flowrate m <sup>3</sup> /h (GPM)
2.5 (0.1)	0 to 0.3 (1)	0 to 0.0054 (0.024)	0 to 10 (33)	0 to 0.176 (0.8)
5 (0.2)	0 to 0.3 (1)	0 to 0.022 (0.1)	0 to 10 (33)	0 to 0.706 (3.1)
10 (0.4)	0 to 0.3 (1)	0 to 0.085 (0.38)	0 to 10 (33)	0 to 2.82 (12.4)
15 (0.5)	0 to 0.3 (1)	0 to 0.2 (0.84)	0 to 10 (33)	0 to 6.36 (28.0)
25 (1.0)	0 to 0.3 (1)	0 to 0.54 (2.35)	0 to 10 (33)	0 to 17.6 (78.0)
40 (1.5)	0 to 0.3 (1)	0 to 1.36 (6.00)	0 to 10 (33)	0 to 45.2 (200)
50 (2.0)	0 to 0.3 (1)	0 to 2.13 (9.35)	0 to 10 (33)	0 to 70.6 (310)
80 (3.0)	0 to 0.3 (1)	0 to 5.43 (24.0)	0 to 10 (33)	0 to 180 (800)
100 (4.0)	0 to 0.3 (1)	0 to 8.49 (37.5)	0 to 10 (33)	0 to 282 (1,250)
150 (6.0)	0 to 0.3 (1)	0 to 19.1 (84.0)	0 to 10 (33)	0 to 636 (2,800)
200 (8.0)	0 to 0.3 (1)	0 to 34.0 (15.0)	0 to 10 (33)	0 to 1,136 (5,000)

- Liquid Conductivity : Size 15 mm (0.5") and above  
; 5  $\mu$ S/cm or more  
Size: 2.5 (0.1"), 5 (0.2"), 10 mm (0.4")  
; 20  $\mu$ S/cm or more

- Power Consumption : 12.5 W or less

- Insulation Resistance : 100 M $\Omega$  between power terminals and ground terminal at 500 V DC, 100 M $\Omega$  between power terminals and each output and contact input terminals at 500 V DC

Before testing the Insulation Resistance always disconnect the short metal bar (jumper) as shown in the figure at below  
After testing, you must return to their original status



000040



# Product Data Sheet

00813-0100-4003, Rev MA  
Catalog 2004

Phos Scrubber water flowmeter

## Rosemount 8800C

TABLE 17. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam <sup>(1)</sup> Flow Rates for line sizes 10 inch/DN 250 through 12 inch/DN 300							
		10 Inch/DN 250				12 Inch/DN 300			
		Rosemount 8800C		Rosemount 8800CR		Rosemount 8800C		Rosemount 8800CR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig	max	35519	16111	22534	10221	50994	23130	35519	16111
(1.03 bar G)	min	3175	1440	2015	914	4554	2066	3175	1440
25 psig	max	46618	21146	29575	13415	66862	30328	46618	21146
(1.72 bar G)	min	4570	2073	2308	1047	5218	2367	4570	2073
50 psig	max	73748	33452	46787	21222	105774	47978	73748	33452
(3.45 bar G)	min	4575	2075	2903	1317	6562	2976	4575	2075
100 psig	max	126660	57452	80356	36449	181663	82401	126660	57452
(6.89 bar G)	min	5996	2720	3804	1725	8600	3901	5996	2720
150 psig	max	178808	81106	113440	51455	256457	116327	178808	81106
(10.3 bar G)	min	7125	3232	4520	2050	10218	4635	7125	3232
200 psig	max	230722	104654	146375	66395	330915	150101	230722	104654
(13.8 bar G)	min	8092	3670	5134	2329	11607	5265	8092	3670
300 psig	max	334810	151867	212411	96348	480203	217816	334810	151867
(20.7 bar G)	min	9749	4422	6185	2805	13983	6343	9749	4422
400 psig	max	440085	199619	279200	126643	631195	286305	440085	199619
(27.6 bar G)	min	11442	5190	7259	3293	16411	7444	11442	5190
500 psig	max	547165	248190	347134	157457	784775	355968	547165	248190
(34.5 bar G)	min	14226	6453	9025	4094	20404	9255	14226	6453

(1) Assumes steam quality is 100%

8800C

## PERFORMANCE SPECIFICATIONS

The following performance specifications are for the Rosemount 8800C, 8800CR, and 8800CD, except where noted. Digital performance specifications applicable to both Digital HART and FOUNDATION fieldbus output.

### Accuracy

Includes linearity, hysteresis, and repeatability.

Liquids—for Reynolds Numbers over 20000

Digital and Pulse Output

±0.65% of rate

Analog Output

Same as pulse output plus an additional 0.025% of span

Note: The accuracy for the 8800CR, line sizes 6 to 12 inch (150 to 300mm), is ±1.0% of rate.

Gas and Steam—for Reynolds Numbers over 15,000

Digital and Pulse Output

±1.35% of rate

Analog Output

Same as pulse output plus an additional 0.025% of span

Note: The accuracy for the 8800CR, line sizes 6 to 12 inch (150 to 300mm), is ±1.50% of rate.

Accuracy limitations for gas and steam:

- for 1/2- and 1-in. (DN 15 and DN 25):

max velocity of 220 ft/s (67.06 m/s)

- for Dual-style meters (all sizes):

max velocity of 100 ft/s (30.5 m/s)

### NOTE

For 1/2-in. through 4-in. (15 mm through 100 mm) line sizes, as the Meter Reynolds number decreases below the stated limit to 10000, the positive limit of the accuracy error band will increase to 2.1% for the pulse output. Example: +2.1% to -0.65% for liquids.

### Repeatability

± 0.1% of actual flow rate

### Stability

±0.1% of rate over one year

### Process Temperature Effect

Automatic K-factor correction with user-entered process temperature

Table 18 indicates the percent change in K-factor per 100 °F (50 °C) in process temperature from reference temperature of 77 °F (25 °C) for direct pulse, or user-entered process temperature.

TABLE 18. Process Temperature Effect

Material	Percent Change in K-Factor per 100 °F (50 °C)
316L @ < 77 °F (25 °C)	+ 0.23 (+ 0.20)
316L @ > 77 °F (25 °C)	- 0.27 (- 0.24)
Hastelloy® C @ < 77 °F (25 °C)	+ 0.22 (+ 0.20)
Hastelloy® C @ > 77 °F (25 °C)	- 0.22 (- 0.20)

000041

## Performance Specifications

(System specifications are given using the unit at referenced conditions.)

### Accuracy

#### Rosemount 8742C Transmitter with 8705 and 8721 Flowtubes

System accuracy is  $\pm 0.5\%$  of rate from 1 to 40 ft/s (0.3 to 12 m/s); includes combined effects of linearity, hysteresis, repeatability, and calibration uncertainty; below 1.0 ft/s (0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s (0.0015 m/s).

#### Rosemount 8742C Transmitter with 8711 Flowtube

System accuracy is  $\pm 0.5\%$  of rate from 3 to 40 ft/s (0.9 to 12 m/s); includes combined effects of linearity, hysteresis, repeatability, and calibration uncertainty; below 3 ft/s (0.9 m/s), the system has an accuracy of  $\pm 0.015$  ft/s (0.005 m/s).

### Vibration Effect

IEC 60770-1

### Repeatability

$\pm 0.1\%$  of reading

### Response Time

0.2 seconds maximum response to step change in input

### Stability

$\pm 0.1\%$  of rate over six months

### Ambient Temperature Effect

$\pm 0.25\%$  of rate over operating temperature range

### EMC Compliance

EN61326-1 1997 (Industrial) electromagnetic compatibility (EMC) for process and laboratory apparatus.

### Transient Protection

The 8742C transmitter prevents damage to the flowmeter from transients compliant to:

IEC 6100 – 4-4 (for burst currents)

IEC 6100 – 4-5 (for surge currents)

### Mounting Position Effect

None when installed to ensure flowtube remains full

## Physical Specifications

### Materials of Construction (Transmitter)

#### Housing

Low-copper aluminum

#### Paint

Polyurethane

#### Cover Gasket

Rubber

### Electrical Connections

Two  $\frac{3}{4}$ –14 NPT with number 8 screw terminal connections are provided for electrical wiring. PG13.5 and CM20 adapters are available. Screw terminals provided for all connections. Power wiring connected to transmitter only. Integrally mounted transmitters are factory wired to the flowtube.

### Mounting

Integrally mounted transmitters do not require interconnecting cables. The local display and transmitter can be rotated in  $90^\circ$  increments. Remote mounted transmitters require only a single conduit connection to the flowtube.

### Weight

Approximately 7 pounds (3.2 kg). Add 0.5 pounds (0.5 kg) for local display.



## Setting the Standard for Pressure Measurement

Industry's best total performance, a flexible Coplanar platform, and guaranteed 5- year stability, has made the Rosemount 3051 the standard in pressure measurement.

### Industry's best total performance of $\pm 0.15\%$

Total performance is the true measure of "real-world" transmitter performance. Using superior sensor technology and engineered for optimal performance, the 3051 delivers unprecedented  $\pm 0.075\%$  reference accuracy, resulting in total operating performance of  $\pm 0.15\%$ . Superior total performance equates to reduced variability and improved plant safety.

### Five year stability of $\pm 0.125\%$

Transmitter stability is a critical measure of transmitter performance over time. Through aggressive simulation testing, the 3051 has proven its ability to maintain performance over a five year period under the most demanding process conditions. Superior transmitter stability reduces calibration frequency to save operation and maintenance costs.

### Unmatched dynamic performance

In dynamic applications, speed of measurement is as important as repeatability. The 3051 responds up to eight times faster than the typical Smart pressure transmitter to detect and control variations quickly and efficiently. Superior dynamic response yields more accurate measurements to reduce variability and increase profitability.

### Coplanar platform enables complete point solutions

The versatile Coplanar platform design enables the right process connection for all your pressure, flow and level applications. Right out of the box, the solution arrives factory calibrated, pressure-tested, and ready to install. Only the 3051 has a scalable, flexible design to reduce engineering and inventory costs.

### Advanced PlantWeb Functionality

Optional functionality includes performance diagnostics and Control Anywhere™. Performance diagnostics - such as plugged impulse line detection and statistical process monitoring - go beyond the transmitter to evaluate the performance of the entire measurement system. Control Anywhere provides user-configurable transmitter-resident function blocks, such as PID, Math, and signal characterization.

## Rosemount Pressure Solutions

### Rosemount 3051S Series of Instrumentation

Scalable pressure, flow and level measurement solutions improve installation and maintenance practices.

### Rosemount 3095MV Mass Flow Transmitter

Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

### Rosemount 305 and 306 Integral Manifolds

Factory-assembled, calibrated and seal-tested manifolds reduce on-site installation costs.

### Rosemount 1199 Diaphragm Seals

Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

### Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections

A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

### Annubar Flowmeter Series: Rosemount 3051SFA, 3095MFA, and 485

The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095MV MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

### Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405

Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream.

### ProPlate Flowmeter Series: Rosemount ProPlate, Mass ProPlate, and 1195

These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

## Performance Specifications

*(System specifications are given using the frequency output and with the unit at reference conditions.)*

### Accuracy

#### Rosemount 8732C with 8705 or 8721 Flowtubes:

System accuracy is  $\pm 0.5\%$  of rate from 1 to 30 ft/s (0.3 to 10 m/s); below 1.0 ft/s (0.3 m/s), the system has an accuracy of  $\pm 0.005$  ft/s (0.0015 m/s). Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

#### Rosemount 8732C with 8711 Flowtube:

System accuracy is  $\pm 0.5\%$  of rate from 3 to 30 ft/s (0.9 to 10 m/s); below 3 ft/s (0.9 m/s), the system has an accuracy of  $\pm 0.015$  ft/s (0.005 m/s). Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

### Vibration Effect

IEC 60770-1

### Repeatability

$\pm 0.1\%$  of reading

### Response Time

0.2 seconds maximum response to step change in input

### Stability

$\pm 0.1\%$  of rate over six months

### Ambient Temperature Effect

$\pm 0.25\%$  change over operating temperature range

### EMC Compliance

EN61326-1 1997 (Industrial) electromagnetic compatibility (EMC) for process and laboratory apparatus.

## Physical Specifications

### Materials of Construction

#### Housing

Low copper aluminum, NEMA 4X and IEC 529 IP66

Pollution Degree II

#### Paint

Polyurethane

#### Cover Gasket

Rubber

### Electrical Connections

Two  $\frac{1}{4}$ –14 NPT connections provided on the transmitter housing. PG13.5 and CM20 adapters are available. Screw terminals provided for all connections. Power wiring connected to transmitter only. Integrally mounted transmitters are factory wired to the flowtube.

### Mounting

Transmitter is mounted integrally with the flowtube and does not require interconnecting cables.

### Transmitter Weight

Approximately 7 pounds (3.2 kg). Add 1 pound (0.5 kg) for Option Code M4.

TABLE 17. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam <sup>(1)</sup> Flow Rates for line sizes 10 inch/DN 250 through 12 inch/DN 300							
		10 Inch/DN 250				12 Inch/DN 300			
		Rosemount 8800C		Rosemount 8800CR		Rosemount 8800C		Rosemount 8800CR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig	max	35519	16111	22534	10221	50994	23130	35519	16111
(1.03 bar G)	min	3175	1440	2015	914	4554	2066	3175	1440
25 psig	max	46618	21146	29575	13415	66862	30328	46618	21146
(1.72 bar G)	min	4570	2073	2308	1047	5218	2367	4570	2073
50 psig	max	73748	33452	46787	21222	105774	47978	73748	33452
(3.45 bar G)	min	4575	2075	2903	1317	6562	2976	4575	2075
100 psig	max	126660	57452	80356	36449	181663	82401	126660	57452
(6.89 bar G)	min	5996	2720	3804	1725	8600	3901	5996	2720
150 psig	max	178808	81106	113440	51455	256457	116327	178808	81106
(10.3 bar G)	min	7125	3232	4520	2050	10218	4635	7125	3232
200 psig	max	230722	104654	146375	66395	330915	150101	230722	104654
(13.8 bar G)	min	8092	3670	5134	2329	11607	5265	8092	3670
300 psig	max	334810	151867	212411	96348	480203	217816	334810	151867
(20.7 bar G)	min	9749	4422	6185	2805	13983	6343	9749	4422
400 psig	max	440085	199619	279200	126643	631195	286305	440085	199619
(27.6 bar G)	min	11442	5190	7259	3293	16411	7444	11442	5190
500 psig	max	547165	248190	347134	157457	784775	355968	547165	248190
(34.5 bar G)	min	14226	6453	9025	4094	20404	9255	14226	6453

(1) Assumes steam quality is 100%

## PERFORMANCE SPECIFICATIONS

The following performance specifications are for the Rosemount 8800C, 8800CR, and 8800CD, except where noted. Digital performance specifications applicable to both Digital HART and FOUNDATION fieldbus output.

### Accuracy

Includes linearity, hysteresis, and repeatability.

Liquids—for Reynolds Numbers over 20000

Digital and Pulse Output

±0.65% of rate

Analog Output

Same as pulse output plus an additional 0.025% of span

Note: The accuracy for the 8800CR, line sizes 6 to 12 inch (150 to 300mm), is ±1.0% of rate.

Gas and Steam—for Reynolds Numbers over 15,000

Digital and Pulse Output

±1.35% of rate

Analog Output

Same as pulse output plus an additional 0.025% of span

Note: The accuracy for the 8800CR, line sizes 6 to 12 inch (150 to 300mm), is ±1.50% of rate.

Accuracy limitations for gas and steam:

- for 1/2- and 1-in. (DN 15 and DN 25):

max velocity of 220 ft/s (67.06 m/s)

- for Dual-style meters (all sizes):

max velocity of 100 ft/s (30.5 m/s)

### NOTE

For 1/2-in. through 4-in. (15 mm through 100 mm) line sizes, as the Meter Reynolds number decreases below the stated limit to 10000, the positive limit of the accuracy error band will increase to 2.1% for the pulse output. Example: +2.1% to -0.65% for liquids.

### Repeatability

± 0.1% of actual flow rate

### Stability

±0.1% of rate over one year

### Process Temperature Effect

Automatic K-factor correction with user-entered process temperature

Table 18 indicates the percent change in K-factor per 100 °F (50 °C) in process temperature from reference temperature of 77 °F (25 °C) for direct pulse, or user-entered process temperature.

TABLE 18. Process Temperature Effect

Material	Percent Change in K-Factor per 100 °F (50 °C)
316L @ < 77 °F (25 °C)	+ 0.23 (+ 0,20)
316L @ > 77 °F (25 °C)	- 0.27 (- 0,24)
Hastelloy® C @ < 77 °F (25 °C)	+ 0.22 (+ 0,20)
Hastelloy® C @ > 77 °F (25 °C)	- 0.22 (- 0,20)

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## Setting the Standard for Pressure Measurement

Industry's best total performance, a flexible Coplanar platform, and guaranteed 5- year stability, has made the Rosemount 3051 the standard in pressure measurement.

3051

### Industry's best total performance of $\pm 0.15\%$

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### Five year stability of $\pm 0.125\%$

Transmitter stability is a critical measure of transmitter performance over time. Through aggressive simulation testing, the 3051 has proven its ability to maintain performance over a five year period under the most demanding process conditions. Superior transmitter stability reduces calibration frequency to save operation and maintenance costs.

### Unmatched dynamic performance

In dynamic applications, speed of measurement is as important as repeatability. The 3051 responds up to eight times faster than the typical Smart pressure transmitter to detect and control variations quickly and efficiently. Superior dynamic response yields more accurate measurements to reduce variability and increase profitability.

### Coplanar platform enables complete point solutions

The versatile Coplanar platform design enables the right process connection for all your pressure, flow and level applications. Right out of the box, the solution arrives factory calibrated, pressure-tested, and ready to install. Only the 3051 has a scalable, flexible design to reduce engineering and inventory costs.

### Advanced PlantWeb Functionality

Optional functionality includes performance diagnostics and Control Anywhere™. Performance diagnostics - such as plugged impulse line detection and statistical process monitoring - go beyond the transmitter to evaluate the performance of the entire measurement system. Control Anywhere provides user-configurable transmitter-resident function blocks, such as PID, Math, and signal characterization.

## Rosemount Pressure Solutions

### Rosemount 3051S Series of Instrumentation

Scalable pressure, flow and level measurement solutions improve installation and maintenance practices.

### Rosemount 3095MV Mass Flow Transmitter

Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

### Rosemount 305 and 306 Integral Manifolds

Factory-assembled, calibrated and seal-tested manifolds reduce on-site installation costs.

### Rosemount 1199 Diaphragm Seals

Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

### Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections

A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

### Annubar Flowmeter Series: Rosemount 3051SFA, 3095MFA, and 485

The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095MV MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

### Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405

Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream.

### ProPlate Flowmeter Series: Rosemount ProPlate, Mass ProPlate, and 1195

These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

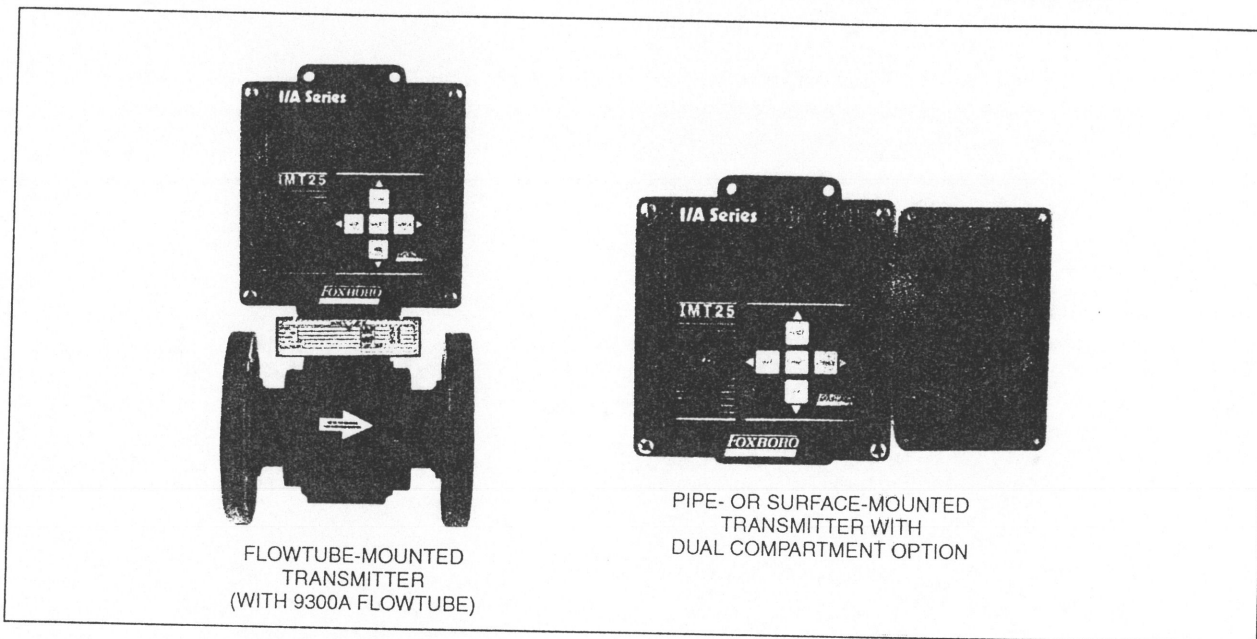


P205 Feed To #2 SPA Unit

## Product Specifications

PSS 1-6F5 A

# I/A Series® Intelligent Magnetic Flow Transmitters Model IMT25 with FoxCom™ or HART® Communication Protocol



The IMT25 Magnetic Flow Transmitter, together with an 8000A Wafer Body, or 2800, 8300, 9100A, 9200A, or 9300A Flanged Body Flowtube, combines to form a Magnetic Flowmeter with pulsed dc excitation.

## FEATURES

- Compatible with Foxboro family of flowtubes.
- Digital precision, stability, and resolution ensure top measurement performance.
- Remote communication via FoxCom or HART Communication Protocol. For FOUNDATION® Fieldbus Protocol, refer to PSS 1-6F5 B.
- Remote configuration using I/A Series System Workstation, Foxboro PC-Based Configurator, or HART Communicator.
- Local configuration using optional integral keypad, with backlit, 2-line, LCD display.
- Compact single or dual compartment.
- Enclosure meets NEMA® 4X and IEC IP66.
- Scaled or frequency pulse output.
- Unidirectional or bidirectional flow.
- Analog output programmable for unidirectional, bidirectional, or multiple input range.
- Relay outputs with programmable functionality for alarms.
- Contact inputs with programmable functionality for remote operation.
- Automatic and manual zero lock.
- Online diagnostic help.
- Software configuration and totals protected in nonvolatile memory in the event of power loss.
- Intrinsically safe electrodes circuit (European applications only).
- Conforms to applicable European Union Directives (product marked with "CE" logo).
- 85 to 264 V ac or 24 V dc input power options.
- Optional I/O access port allows direct external connection of remote configurator.
- Field test mode using Foxboro Model IMTSIM Magnetic Flow Simulator.
- Standard 2-year warranty.

000030

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# **SYSTEM PERFORMANCE SPECIFICATIONS – TRANSMITTER AND FLOWTUBE** (At Reference Operating Conditions unless Otherwise Specified)

## **Accuracy Notes**

- Accuracy specified as percent of flow rate reading, unless otherwise indicated.
- Accuracy specified using water as the fluid at reference operating conditions.
- Accuracy specified with 8000A, 8300, 9100A, 9200A, 9300A, and 2800 Series Flowtubes
- Accuracy rating assumes no flange piping mismatch, and also assumes a straight pipe upstream (5 pipe diameters minimum) and a straight pipe downstream (3 pipe diameters minimum) measured from center of flowtube.
- Accuracy rating includes effects of hysteresis, linearity, zero error, and repeatability.

## **Accuracy – Pulse and Digital Output; with 8000A, 8300, and 2800 Series Flowtubes**

8000A	8300	2800(a)	System Accuracy	Flow Velocity
1/2 to 6 in (15 to 150 mm)	1/2 to 18 in (15 to 450 mm)	None	$\pm 0.25\%$ of Reading $\pm 0.005$ ft/s ( $\pm 0.015$ m/s)	$\geq 2.0$ fps ( $\geq 0.61$ m/s) $< 2.0$ fps ( $< 0.61$ m/s)
1/16 to 1/4 in (1.16 to 6 mm)	20 to 36 in (500 to 900 mm)	None	$\pm 0.50\%$ of Reading $\pm 0.010$ ft/s ( $\pm 0.0305$ m/s)	$\geq 2.0$ fps ( $\geq 0.61$ m/s) $< 2.0$ fps ( $< 0.61$ m/s)
None	None	All Sizes	$\pm 1.00\%$ of Reading $\pm 0.033$ ft/s ( $\pm 0.010$ m/s)	$\geq 3.3$ fps ( $\geq 1$ m/s) $< 3.3$ fps ( $< 1$ m/s)

(a) Values in table above are for 2800 Series Flowtubes that have been calibrated for use with IMT25 Transmitters. An average factor can be used, at a reduced accuracy, for 2800 Series Flowtubes that do not have an IMT25 Transmitter calibration factor.

## **Accuracy – Pulse and Digital Output; with 9100A, 9200A, and 9300A Flowtubes**

9100A	9200A	9300A	System Accuracy	Flow Velocity
None	None	1/2 to 6 in (25 to 150 mm)	$\pm 0.25\%$ of Reading $\pm 0.005$ ft/s ( $\pm 0.0015$ m/s)	$\geq 2.0$ fps ( $\geq 0.61$ m/s) $< 2.0$ fps ( $< 0.61$ m/s)
1 to 78 in (25 to 2000 mm)	8 to 40 in (200 to 1200 mm)	8 to 16 in (200 to 400 mm)	$\pm 0.50\%$ of Reading $\pm 0.010$ ft/s ( $\pm 0.00305$ m/s)	$\geq 2.0$ fps ( $\geq 0.61$ m/s) $< 2.0$ fps ( $< 0.61$ m/s)

## **Accuracy – 4 to 20 mA Output**

Same as for pulse and digital outputs except add  $\pm 0.03\%$  of span (which equates to  $\pm 0.0048$  mA) to pulse and digital accuracy values above.

## **Response Time**

Digital and Pulse		4 to 20 mA
50 Hz	60 Hz	Add 0.150 sec
0.2 sec	0.167 sec	

## **Ambient Temperature Effect**

(For any variation from Reference Operating Temperature within the Operating Limits)

### **DIGITAL OUTPUT**

$< 0.5\%$  of span

### **4 to 20 mA OUTPUT**

$< 1\%$  of span

### **PULSE OUTPUT**

$< 0.5\%$  of span

## **RFI Effect**

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

## **Supply Voltage Effect**

### **DIGITAL AND PULSE OUTPUT**

A change in supply voltage of +10 or -15% from reference can cause the output to change  $< 0.1\%$  or  $< 0.15\%$  of reading, or  $< 0.001\%$  or  $0.0015\%$  of flowmeter capacity, whichever is greater.

### **4 TO 20 mA OUTPUT**

Digital/Pulse output effect plus an additional error of  $0.005\%/volt$

## **RFI Effect**

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

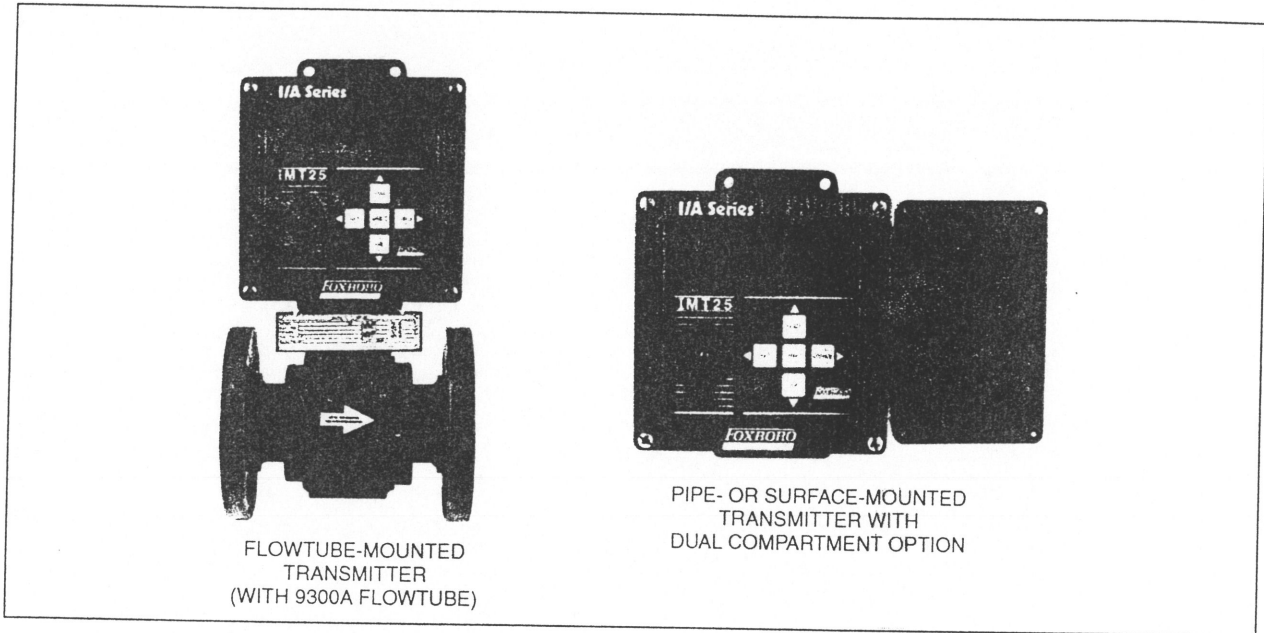
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205 Feed To #1 SPA Unit

## Product Specifications

PSS 1-6F5 A

# I/A Series® Intelligent Magnetic Flow Transmitters Model IMT25 with FoxCom™ or HART® Communication Protocol



The IMT25 Magnetic Flow Transmitter, together with an 8000A Wafer Body, or 2800, 8300, 9100A, 9200A, or 9300A Flanged Body Flowtube, combines to form a Magnetic Flowmeter with pulsed dc excitation.

## FEATURES

- Compatible with Foxboro family of flowtubes.
- Digital precision, stability, and resolution ensure top measurement performance.
- Remote communication via FoxCom or HART Communication Protocol. For FOUNDATION® Fieldbus Protocol, refer to PSS 1-6F5 B.
- Remote configuration using I/A Series System Workstation, Foxboro PC-Based Configurator, or HART Communicator.
- Local configuration using optional integral keypad, with backlit, 2-line, LCD display.
- Compact single or dual compartment.
- Enclosure meets NEMA® 4X and IEC IP66.
- Scaled or frequency pulse output.
- Unidirectional or bidirectional flow.
- Analog output programmable for unidirectional, bidirectional, or multiple input range.
- Relay outputs with programmable functionality for alarms.
- Contact inputs with programmable functionality for remote operation.
- Automatic and manual zero lock.
- Online diagnostic help.
- Software configuration and totals protected in nonvolatile memory in the event of power loss.
- Intrinsically safe electrodes circuit (European applications only).
- Conforms to applicable European Union Directives (product marked with "CE" logo).
- 85 to 264 V ac or 24 V dc input power options.
- Optional I/O access port allows direct external connection of remote configurator.
- Field test mode using Foxboro Model IMTSIM Magnetic Flow Simulator.
- Standard 2-year warranty.

000032

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## SYSTEM PERFORMANCE SPECIFICATIONS – TRANSMITTER AND FLOWTUBE

(At Reference Operating Conditions unless Otherwise Specified)

### Accuracy Notes

- Accuracy specified as percent of flow rate reading, unless otherwise indicated.
- Accuracy specified using water as the fluid at reference operating conditions.
- Accuracy specified with 8000A, 8300, 9100A, 9200A, 9300A, and 2800 Series Flowtubes
- Accuracy rating assumes no flange piping mismatch, and also assumes a straight pipe upstream (5 pipe diameters minimum) and a straight pipe downstream (3 pipe diameters minimum) measured from center of flowtube.
- Accuracy rating includes effects of hysteresis, linearity, zero error, and repeatability.

### Accuracy – Pulse and Digital Output; with 8000A, 8300, and 2800 Series Flowtubes

8000A	8300	2800(a)	System Accuracy	Flow Velocity
1/2 to 6 in (15 to 150 mm)	1/2 to 18 in (15 to 450 mm)	None	$\pm 0.25\%$ of Reading	$\geq 2.0$ fps ( $\geq 0.61$ m/s)
			$\pm 0.005$ ft/s ( $\pm 0.015$ m/s)	$< 2.0$ fps ( $< 0.61$ m/s)
1/16 to 1/4 in (1.16 to 6 mm)	20 to 36 in (500 to 900 mm)	None	$\pm 0.50\%$ of Reading	$\geq 2.0$ fps ( $\geq 0.61$ m/s)
			$\pm 0.010$ ft/s ( $\pm 0.0305$ m/s)	$< 2.0$ fps ( $< 0.61$ m/s)
None	None	All Sizes	$\pm 1.00\%$ of Reading	$\geq 3.3$ fps ( $\geq 1$ m/s)
			$\pm 0.033$ ft/s ( $\pm 0.10$ m/s)	$< 3.3$ fps ( $< 1$ m/s)

(a) Values in table above are for 2800 Series Flowtubes that have been calibrated for use with IMT25 Transmitters. An average factor can be used, at a reduced accuracy, for 2800 Series Flowtubes that do not have an IMT25 Transmitter calibration factor.

### Accuracy – Pulse and Digital Output; with 9100A, 9200A, and 9300A Flowtubes

9100A	9200A	9300A	System Accuracy	Flow Velocity
None	None	1/2 to 6 in (25 to 150 mm)	$\pm 0.25\%$ of Reading	$\geq 2.0$ fps ( $\geq 0.61$ m/s)
			$\pm 0.005$ ft/s ( $\pm 0.015$ m/s)	$< 2.0$ fps ( $< 0.61$ m/s)
1 to 78 in (25 to 2000 mm)	8 to 40 in (200 to 1200 mm)	8 to 16 in (200 to 400 mm)	$\pm 0.50\%$ of Reading	$\geq 2.0$ fps ( $\geq 0.61$ m/s)
			$\pm 0.010$ ft/s ( $\pm 0.00305$ m/s)	$< 2.0$ fps ( $< 0.61$ m/s)

### Accuracy – 4 to 20 mA Output

Same as for pulse and digital outputs except add  $\pm 0.03\%$  of span (which equates to  $\pm 0.0048$  mA) to pulse and digital accuracy values above.

### Response Time

Digital and Pulse		4 to 20 mA
50 Hz	60 Hz	Add 0.150 sec
0.2 sec	0.167 sec	

### Ambient Temperature Effect

(For any variation from Reference Operating Temperature within the Operating Limits)

#### DIGITAL OUTPUT

$< 0.5\%$  of span

#### 4 to 20 mA OUTPUT

$< 1\%$  of span

#### PULSE OUTPUT

$< 0.5\%$  of span

### RFI Effect

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

### Supply Voltage Effect

#### DIGITAL AND PULSE OUTPUT

A change in supply voltage of +10 or -15% from reference can cause the output to change  $< 0.1\%$  or  $< 0.15\%$  of reading, or  $< 0.001\%$  or  $0.0015\%$  of flowmeter capacity, whichever is greater.

#### 4 TO 20 mA OUTPUT

Digital/Pulse output effect plus an additional error of  $0.005\%/volt$

### RFI Effect

The output error is less than 5% of calibrated span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 10 V/m when the transmitter is properly installed and housing covers are in place.

000033